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A method for manufacturing sealed, fluid-filled containers of thermoplastic material

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This invention concerns a method for manufacturing a sealed fluid-filled container of thermoplastic material which is made from a tube after a portion of the tube has been filled with fluid, paste or the like.

Such manufacturing methods are known wherein a tube of thermoplastic material is filled with the fluid or the like, after which the walls of the tube are pressed together by a pressing device equipped with heating surfaces, so that the compressed tube walls can simultaneously be welded together. Such sealed containers which are filled with fluid, paste or the like and manufactured in the aforedescribed manner can hold relatively little fluid or the like in comparison with the volume of the container, so that such a package, whose tube walls are extremely thin, becomes soft and, in connection with the production of a large number of such containers or packages, entails the consumption of more tube material than is necessary.

The purpose of the present invention is consequently to

provide a manufacturing method wherein the welding of the tube walls is performed in such a manner that the fluid, paste or the like is contained within the sealed container under pressure, thereby making it possible to get the maximum amount of fluid or the like into the container.

This is achieved according to the invention in that a section of tubing which is sealed at one end is filled with fluid, paste or the like in the usual manner, after which a pressing device presses the tube walls together at a specified point and, after the pressing device has pressed the tube walls together and enclosed a specified quantity of fluid, the point of compression is continuously moved toward the sealed bottom of the container, so that the volume of the sealed section of tubing which contains the quantity of fluid is reduced in relation thereto. When the desired pressure within the sealed container is achieved, the tube walls are welded together and the sealed container is cut loose from the remaining portion of the tube in the usual manner, after which the process can be repeated.

The movement of the point of compression can be achieved in a number of ways, and an example of an appropriate embodiment of the invention is provided in the following description of the drawing.

Figures 1, 2 and 3 are schematic depictions of the various steps in the process, while Fig. 4 presents a schematic diagram of the entire machine, with its heating surfaces.

The walls of a tube of elastic thermoplastic material are designated 1, which tube 1 is partially filled by means of a pipe 2 with a material in paste or fluid form. The tube is preferably filled with this fluid or the like up to a specified level, for example, as indicated by 3, so that a somewhat predetermined fluid pressure is already present in the tube 1. After the tube 1 has been filled with fluid, the two semicylindrical members 4 and 5 are pressed together until they press the tube walls 1 together completely, as shown in Fig. 2. At the same moment as the members 4 and 5 are pressed together, a specified amount of fluid is enclosed within the container 6 thus formed. The two members 4 and

5 continue to press against one another, so that the fluid in the container 6 cannot escape. The two members 4 and 5 are then caused to turn each their own way, as indicated by the arrows 7 and 8. The point of compression 9 will thus be moved toward the sealed end 10 of the container 6. The length of the container 6 will thus be shortened while the quantity of fluid in the container remains the same, and the pressure inside the container 1 will thus be increased and, once the desired pressure is achieved, the tube walls 1 are welded together by means of heating elements 11 and 12, which are mounted on the compression members 4 and 5. In combination with the welding elements 11 and 12, there are also present cutting devices which cut the tube in the usual manner, thereby creating a free container 6, while the remaining length of tubing 13 will be sealed at one end and the pressing devices 4 and 5 separated from one another again, thereby allowing the process to begin again. This manufacturing process can thus be repeated continuously, since the pressing devices 4 and 5 can be made to move downward in the direction of arrow 14, so that the compression and welding operations follow the movement of the tube 1 during the continuous feed thereof. Once the welding and cutting operations have been performed and the pressing devices 4 and 5 have moved apart from one another, they are returned again to their initial positions.

This movement of the pressing devices 4 and 5 can be achieved by means of mechanical control devices or with the help of electrical impulses, or the entire operation can be performed by means of hydraulic transmission, possibly in combination with electrical impulses. The pressing devices 4 and 5 must conform in size and shape to the size of the container 6, and to the pressure sought in the container. However, different pressures can be achieved in the container 6 using the same pressing devices 4 and 5 by turning said devices to a greater or lesser extent in the opposite direction in connection with their initial orientation during compression as shown in Fig. 2, thereby making it possible to vary the length of the path from the point of compression 9 to

the welding elements 11 and 12 or, in other words, making it possible to vary the displacement of the point of compression 9 toward the sealed end 10 of the container. The pressure can also be varied by varying the sizes of the components 4 and 5. These components need not be semicylindrical, but may appear in other shapes, such as elliptical, in that the only required condition is that they be able to roll against one another in such a way that the compression achieved in connection with the movement of the point of compression takes places continuously, so that the fluid cannot escape from the sealed container 6.

A device for the entire process is shown in Fig. 4, wherein 15 designates a container for the product to be packaged, such as a fluid, and wherein a feed pipe 16 which is equipped with a tap 17 is attached to the container. A foil 18 of thermoplastic material is fed over guide rollers 19 and 20 to a wrapping device which wraps the foil 18 around a tube 21. The edges of the foil 18 are welded together by means of a welding element 22, thereby forming a sealed tube 23. The compression elements 24 and 25 will then handle the compression operation, the pressure increase achieved in the container thus formed and the welding together of the tube walls, as described in connection with Figs. 1, 2 and 3.

In connection with the aforedescribed method, it is appropriate to use a foil 18 instead of a finished tube, since this makes it possible for the method to be employed in a continuous manner.

CLAIM

A method for manufacturing filled containers of elastic and thermoplastic material in which a length of tubing is filled with fluid, paste or the like, after which the tube walls are pressed together by means of a pressing device equipped with heating surfaces so that the tube walls are welded together and the tube is cut to form a sealed container, while the end of the remaining tubing is simultaneously sealed, characterized in that a pressing device (4, 5) is moved in relation to the tube (1) toward the sealed bottom (10) of the container (6), thereby increasing the pressure inside the container, after which the top (9) of the container is welded together once the desired pressure has been reached in the container.

Cited publications:

British patent no. 599.174
French patent no. 1.034.838
US Patent no. 2.142.505